ATTACHMENT 18 – MEMO TO FILE: JOSEPH MULLIN, MMS, MAY 12, 2008

NTSB
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594-0001
www.ntsb.gov

May 13, 2008

Memo to File

File: Cosco Busan Allision with San Francisco-Oakland Bay Bridge
NTSB No.: DCA08MM004

Re: Oil Spill Remote Sensing Technology. Telephone Contact with Joseph Mullin, U.S. Department of the Interior, Minerals Management Service. Tel. 703-787-1556.

On 5/12/08, I conversed with Joseph Mullin, who manages research projects relating to remote sensing and surveillance of oil spills for the U.S. Department of the Interior Mineral Management Service (MMS). Mr. Mullin provided his perspective on the current state of remote sensing technology in the United States, and the status of a current MMS project to develop an aerial sensor array for real-time oil slick thickness mapping.

Mullin advised that there are numerous remote sensing instruments that range from satellite deployed systems to hand held equipment. Several technologies such as synthetic aperture radar (SAR) and side looking aerial radar (SLAR) involve bulky sensors that require dedicated aircraft and are one-of-a-kind systems. These systems are very expensive to purchase and maintain (millions of dollars). The disadvantage of such equipment for use in the United States is the vast amount of coastline coverage that is required: Alaska, West Coast, Gulf Coast, East Coast, and Great Lakes. Numerous dedicated aircraft would therefore be required to be available in key locations, and oil spills simply do not occur with enough frequency to justify such expense. However, several European countries (Germany for example) are enjoying success with SAR and SLAR and other oil spill remote sensing instruments (UV/IR sensors and laser fluourosensors), mainly due to the pooling of their resources and because the limited operational area surrounding the North Sea lends itself to the use of dedicated aircraft. The European nation members of the Bonn Agreement also use these aircraft to fulfill other law enforcement missions while patrolling for oil spills.

Other than the European work with oil spill remote sensing, Mullin is aware of research that was being conducted by Environment Canada in Ottawa, involving a laser Doppler system. MMS as well as other Canadian agencies and organizations provided some funding for this research, however the Canadian government subsequently withdrew its funding and the project was terminated. No operational oil spill remote sensor resulted from the Canadian project.

Mullin described an on-going project funded by MMS [1] and the California DFG/OSPR that has an objective of developing a portable, easy to operate, aerial multispectral sensor with the capability of mapping oil slick thickness and distribution in coastal and offshore waters. In designing such a system, Mullin stressed the importance of being able to quickly install the sensor package in an aircraft or helicopter of opportunity. Additionally, the project is working toward a relatively inexpensive instrument ($50 - 60,000), in order that it can be purchased by local governments and oil spill response organizations and staged throughout the country. Another key design feature is the capability to datalink with oil spill responders and unified command in order to maximize efficiency of oil spill response resources by

[1] U.S. Department of the Interior Minerals Management Service Project Number 594, Development of a Portable Multispectral Aerial Sensor for Real-time Oil Spill Thickness Mapping in Coastal and Offshore Waters.

directing them to the thickest part of the oil slick. Although the multispectral sensor uses existing infra red (IR) and other optical sensor technology, recent advances in computing power has allowed for enhanced processing of digital signals and thus the deduction of oil film thickness. To Mullin's knowledge, the MMS project is the only research currently being conducted in the United States for remote detection of oil slick thickness. MMS is also currently engaged in other remote sensing projects to identify sunken oil, and oil under ice and snow. The U.S. Coast Guard and the National Oceanic and Atmospheric Administration are funding research to locate sunken oil.

Although the MMS goal is to develop a multispectral sensor prototype by next year, it would be necessary for an, as yet unidentified, instrument manufacturer to construct and market such a device. The prototype instrument is being developed and tested by Ocean Imaging Corporation, 201 Lomas Santa Fe Drive, Suite 370, Solana Beach CA 92075. The principal investigators are Dr. Jan Svejkovsky, President of Ocean Imaging (858-792-8529), and Judd Muskat, CA DFG/OSPR (916-324-3411). Mullin indicated that the instrument's use in poor visibility has not yet been validated, and he referred me to Dr. Svejkovsky for further information concerning the capability of this sensor package to detect oil spills in foggy or foul weather.

In October 2007, test flights of the multispectral sensor system were begun over natural oil seeps in the Santa Barbara Channel. Further testing has been done at the Ohmsett National Oil Spill Response Test Facility in Leonardo, NJ [2] in order to tune the sensor to differentiate between oil and other interfering substances. OSPR has also obtained experimental imagery using the multispectral sensor over San Francisco Bay area during the November 2007 *Cosco Busan* oil spill incident, however no validation of this data had been obtained by simultaneous ground tracking. Future testing of the remote sensor includes a June 2008 scheduled USCG Prep-Drill in Southern California, during which the sensor will be used to track a dye plume and attempt to download imagery data to the incident command post. Also, on June 16-20, 2008, a full week of operational sensor testing that will include night testing of the device will be conducted at the Ohmsett Facility.

In closing, Mullin commented that a lack of information thus far provided to State legislators and Congress has led to a disconnect between decision makers and research and development of new technologies to detect, contain and remove oil from the surface of water, including Arctic conditions.

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RPH-20

[2] The Ohmsett National Oil Spill Response Test Tank Facility located at the Naval Weapons Station Earle, Waterfront, Route 36, Building R-26, Leonardo, NJ, is the only facility where full-scale oil spill response equipment testing, research, and training can be conducted in a marine environment with oil under controlled environmental conditions (waves, temperature, oil types). The facility provides an environmentally safe place to conduct objective testing and to develop devices and techniques for the control of oil and hazardous material spills.